



NOAA Office of Ocean Exploration Quick Look Report

Expedition Title: Sonar mapping of biologically-engineered and other complex habitats at the shelf edge and upper slope of the South Atlantic Bight

Results (please check all disciplines in which this cruise collected data)	Details (please describe any novel discoveries in the discipline, answers such as "possible, awaiting data analysis" and "no apparent discoveries" are acceptable)
Bathymetric Mapping <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note total area mapped and technology employed, e.g. multibeam, side scan, etc.) Approximately 26400 hectares (102 sq. mi.) surveyed with multibeam sonar. Approximately 25% of this area was surveyed with side scan and/or chirp sonar.
New Species Discovered <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note number, type, and significance ,i.e. radically new vs. slight adaptation of known species) None
Bio-prospecting <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note number, type, and potential use of new compounds discovered) None
Habitat Range Extended <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note species discovered in new habitats and how far from previous range were they found) None
Chemical Processes <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note new or unusual chemical properties such as methane seeps, hypersaline pools, vents, etc. observed) None
Geologic Processes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note new or unusual geologic processes that may impact scientific understanding of the region) Mapped apparent ancient shorelines and faults. Apparent keel marks caused by icebergs at 170-220 m on the upper slope.
Physical Processes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note new or unusual oceanographic processes that may impact scientific understanding of the region) ADCP and surface hydrographic data measured. Will be analyzed by cooperating scientists at the University of South Carolina. CTD casts taken for sound velocity corrections. Data will also be analyzed at USC.
Sub/ROV/AUV Dives <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note name, type, and cumulative hours of bottom time for each platform / if available please provide average working time per dive for each platform / please note if new depth records were set) Planned ROV dives not completed because of ship's mechanical problems and delay in getting ROV.
New Technology <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note any new tools developed for or during this cruise, also identify first use of an existing technology in a new application)
Maritime Cultural Heritage <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note discoveries impacting knowledge of the past, i.e. number and type of shipwrecks)
Outreach <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please describe outreach channels, e.g. Web, port call, etc., used in this project) Cruise plans and preliminary results from 2006 cruise were presented at several OE and COSEE-SE workshops for teachers, prior to the cruise. A press release was released prior to the cruise and we are working on a post-cruise press release. An OE web site was prepared.
Students Involved <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note the number and level of students on the expedition) One M.S. student from the College of Charleston was on the cruise. A teacher-at-sea responded to emailed questions from students.
Multidisciplinary <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please identify the formal disciplines represented in the science party) Geology, geophysics, ichthyology, fisheries, education.
Exploration of New Regions <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note if the area of operations had been previously studied, if so please check no and approximate as slight, moderate or significant, the level of knowledge before the cruise) Some of the areas had been explored on OE submersible dives. Others had been sampled with fishery survey gear (fish traps, longlines).

Ocean Exploration Quick Look Report Required Elements

The Office of Ocean Exploration (OE) does not require a specific Quick Look Report format. Reports submitted under other requirements (e.g. Cruise Summary Report (CSR)) or Fisheries-Oceanography Coordinated Investigations (FOCI)) are acceptable. In all cases Quick Look Reports submitted to OE should contain the following elements:

Project title: Sonar mapping of biologically-engineered and other complex habitats at the shelf edge and upper slope of the South Atlantic Bight

Principal Investigator and institution: George R. Sedberry, South Carolina Department of Natural Resources

Expedition title: NF-07-10-OE

Expedition dates and itinerary: 26 Jun – 2 Jul 2007. Survey shelf edge and slope sites off South Carolina and Georgia, including proposed Marine Protected Areas and important fishery habitats. Map habitats and biologically-engineered habitats such as worm reefs, coral mounds, grouper pits, tilefish burrows and triggerfish nests. Map additional scour marks on upper slope. Proceed from northernmost sites off Bulls Bay SC south along the shelf edge to shelf-edge sites off Beaufort SC, then offshore to slope and Charleston Bump sites off GA.

Chief Scientist and institution: George R. Sedberry, Gray's Reef National Marine Sanctuary

Co-sponsors / partners / participating organizations: (a table of names and affiliations)

Cruise Participants:

Gayes, Paul	Coastal Carolina University
Harris, Scott	Coastal Carolina University
Hill, Jenna	Scripps Institute of Oceanography
Philips, James	Coastal Carolina University
Sedberry, George	Gray's Reef National Marine Sanctuary
Stephen, Jessica	South Carolina Department of Natural Resources
Trufan, Denise	Indian Land Elementary/ Middle School
Wieber, Kim	College of Charleston
Wyanski, David	South Carolina Department of Natural Resources

Collaborating Investigators (not on cruise):

Coleman, Felicia	Florida State University
Koenig, Chris	Florida State University
Sautter, Leslie	College of Charleston
Scanlon, Kathy	United States Geological Survey

Vessel Identification: NOAA Ship *Nancy Foster*

Primary Equipment: multibeam sonar, EdgeTech sidescan sonar, EdgeTech chirp sonar.

Geographic area of operations: South Atlantic Bight (see map).

Summary of Expedition Objectives:

The following objectives were met:

1. Use multibeam sonar to map bottom topography in areas that are important fish habitats and spawning grounds, as determined from historical fishery-independent sampling, commercial landings and ongoing complementary studies already funded by NOAA.
2. Use side-scan sonar to map smaller features (particularly features excavated by fishes), such as low mounds built by tube worms, coral mounds, solution holes, and other small-scale features.
3. Develop educational materials from the research.

Milestones Achieved:

In spite of mechanical delays with the ship and ROV, mechanical problems that canceled the second cruise leg, and weather problems, we successfully mapped fish and coral habitat in two distinct features of the outer shelf and slope. These included shelf-edge reefs where many fishes spawn and where worm and coral mounds are found, and upper slope reefs where deep groupers live and where we found evidence of iceberg scouring of the bottom. Sonar maps of shelf-edge reefs revealed

additional extensive cusped reef at about 50 m, with “capes” of wider reef habitat stretching seaward from the cusps. Additional reefs with a shoreward-facing scarp were found offshore of the main shelf-edge reef, and ridges were noted on the reef top. Extensive areas of rough bottom with deep-cut channels and low pinnacles were found on the upper slope around 200 m depth. This rough bottom supports populations of snowy grouper, blueline tilefish and blackbelly rosefish.

Sample log entries:

Log entries included logging of the beginning and end of each sonar line, logging of turns during sonar transect, logging of sound velocity CTD casts, and continuous logging of the ship's ADCP and surface temperature/fluorometry measurements.

Summary of Digital Data Collected: Approximately 40 GB of multibeam sonar, ADCP and CTD data were collected.

Summary of outreach and educational activities: A press release describing the mission was promulgated. Educational materials are being incorporated into presentation materials to be used by the investigators in public outreach programs. A teacher-at-sea participated in all cruise activities and replied to emailed questions about the cruise. She is preparing presentation and classroom materials from her experiences.

Thoughts for the Future: Additional sonar mapping is needed, and should be ground-truthed with visual observations (ROV). A dedicated hydrographic survey ship could accomplish more mapping that can be done from multipurpose vessels.

Summary of Expedition Operations: See map and summary table that follows:

Date	Comments
25 June	Departure delayed
26 June	Blocks 3-5 10 multibeam, side scan and chirp
27 June	Blocks 3-5, 10 multibeam, side scan and chirp
28 June	Blocks 3-5, 10 multibeam, side scan and chirp and multibeam; rendezvous with R/V <i>Silver Crescent</i> and Paul Gayes
29 June	Fill in multibeam lines on Blocks 3-5 and adjacent reef
30 June	Block 9, 1, multibeam, side scan, chirp
1 July	Block 2 multibeam, side scan, chirp
2 July	Block 2 multibeam, side scan, chirp; Arrive Charleston
9 July	Demobilize

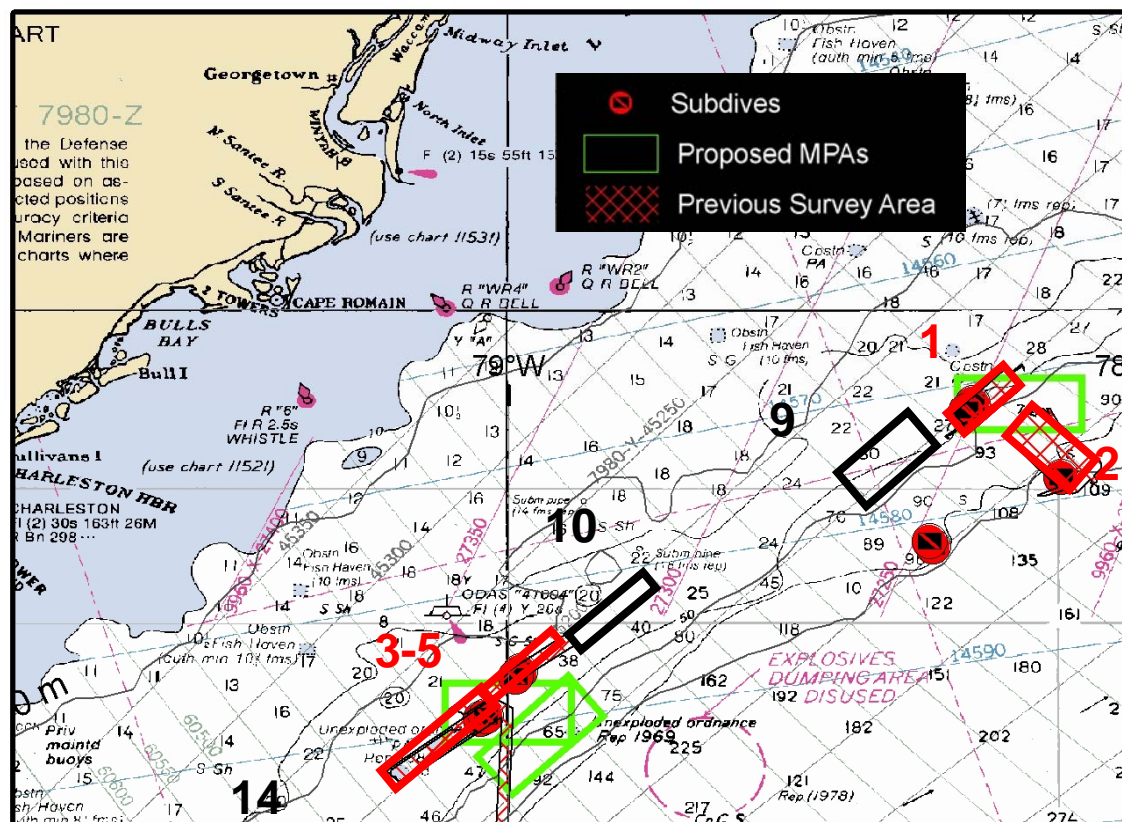


Fig. 1. Areas surveyed with sonar in 2006 that were revisited in 2007 (numbered red boxes), new sites surveyed in 2007 (numbered black boxes), along with OE-SCDNR dive sites (red circles), and proposed MPA sites (green boxes).

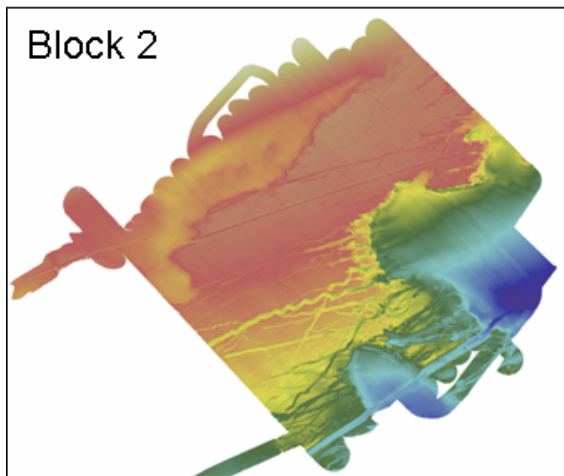
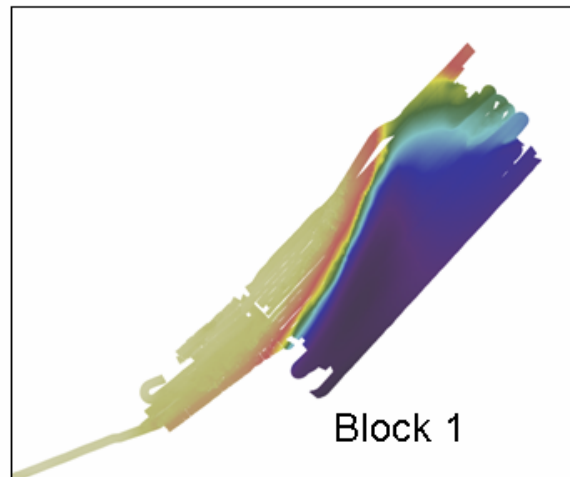
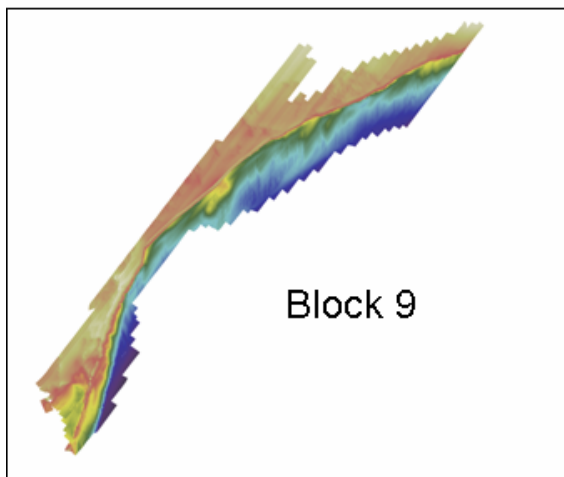
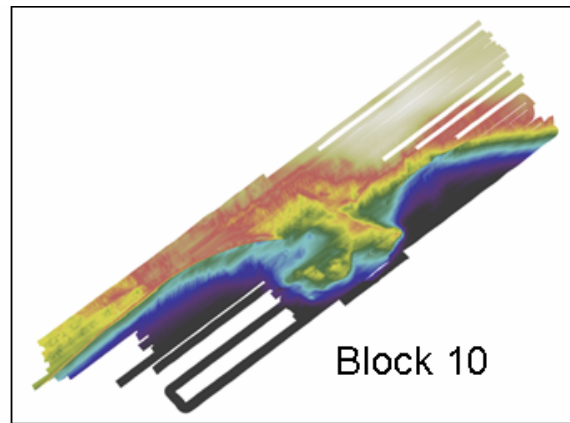
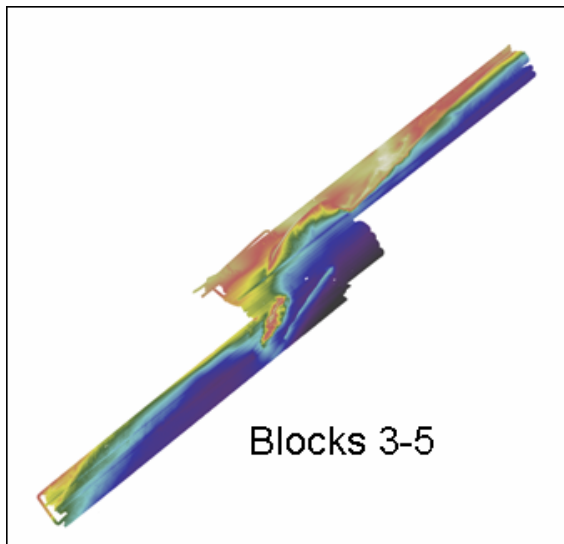


Fig. 2. Multibeam sonar images of blocks surveyed during the cruise. Images include sonar data from the 2006 cruise.